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Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARYWT Docket No. 01-146  
RM-9966*In the Matter of*

Amendment of Part 90 of the )  
Commission's Rules and Policies for )  
Applications and Licensing of )  
Low Power Operations in the Private )  
Land Mobile Radio 450-470 MHz Band )

TO: The Secretary

**COMMENTS OF DATARADIO COR, LTD.**

Dataradio COR, Ltd. ("Dataradio" or "Dataradio COR") hereby files comments in response to the Commission's Notice of Proposed Rulemaking and request for comment in the above matter, released on July 24, 2001 (hereafter, "NPRM"), and announced in the Federal Register at 66 Fed. Reg. 47435 (September 12, 2001).

Dataradio COR is a major producer of wireless data communications equipment. These comments focus on the NPRM as it effects data communications.

Dataradio COR is part of the Dataradio group of companies, which also includes Dataradio, Inc. and Dataradio Corporation.<sup>1</sup> Collectively, the Dataradio companies are engaged in the development, manufacture and implementation of a wide range of wireless products and networks that support data applications for both mobile and fixed uses in the Public Safety, quasi-public safety and private wireless communities.

Dataradio COR focuses primarily on fixed data applications. Its products include a variety of data and telemetry applications such as: Supervisory Control and Data Acquisition Systems ("SCADA"); Data Acquisition Systems; Automatic Vehicle Location ("AVL")

<sup>1</sup> Dataradio COR was formerly a division of the EF Johnson Company and was known as Johnson Data Telemetry Corporation.

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systems; inventory management; automation and control systems; Global Positioning Systems (“GPS”) and robotics. Dataradio COR serves the data application needs of users in almost 40 countries around the world. It has developed wireless data products for the UHF, VHF and 900 MHz bands. Among its customers are the utilities, petrochemical, transportation, water, construction and defense markets.

Dataradio’s comments on the NPRM focus primarily on (i) the proposed power and antenna height limitations, and (ii) the proposed division of low power channels into four groups with corresponding voice and non-voice use limitations. Dataradio believes these two issues are inextricably tied; decisions made on these issues today will have far reaching implications that significantly impact critical future spectrum requirements in the evolving market for communications solutions. In this market, three trends are undeniable:

- First, both the need for and deployment of data solutions are increasing very rapidly.
- Second, there exists a clear and obvious necessity for the FCC to require maximum spectral efficiency for both voice and data users of private licensed non-auctioned spectrum—the result is ever-narrower operational channels.
- Third, the line between voice and data becomes blurred as equipment manufacturers migrate to fully digital platforms, where voice is converted to data (ones and zeros) and reconstructed to voice.

The NPRM is based on a low power consensus plan for the 450-470 MHz band that was developed by the Land Mobile Communications Council (LMCC) and submitted to the Commission in 1997 (the “Consensus Plan”), that does not fully account for these three trends.<sup>2</sup> In the four years since the Consensus Plan was created, technology and more

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<sup>2</sup> NPRM, par. 4.

importantly, market forces, have significantly altered the conditions and the required solution. The context of this rulemaking presents an opportunity that the Commission should not let pass to revise the plan in accordance with up to date market realities and trends.

**A. The NPRM Underestimates the Rapidly Increasing Demand for Wireless Data Communications**

The demand for wireless data communications has experienced explosive growth over the past several years. This trend is expected to continue. Based on an analysis of recent market trends and expected near and long-term demands, the ARC Group has stated, “About one billion people will use wireless data services by 2005.”<sup>3</sup> Similarly, the Yankee Group has forecast rapidly increasing market demand for wireless data solutions.<sup>4</sup>

There is, in particular, increasing demand for fixed wireless data solutions required by quasi-Public Safety sector entities—e.g., in the utilities (electric power generation and distribution), transportation (railroad), energy (oil and gas), freshwater and wastewater sectors. In these sectors there is growing reliance on data communications for critical operations that pertain to the safety and security of the civilian population. In this context, we note that in the response to recent events, the FBI has demanded a higher state of monitoring and security for these segments.<sup>5</sup>

When the LMCC was developing the Consensus Plan some four years ago, users and market forecasters were not anticipating the rapid growth in and demand for data solutions

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<sup>3</sup> See Exhibit 1 hereto.

<sup>4</sup> See Exhibit 1 hereto.

<sup>5</sup> See, e.g., “Security Tightened at Water Suppliers,” *Washington Post*, October 7, 2001, pg. PW01, discussing a recent FBI advisory issued to water agencies and departments indicating that additional security measures should be employed in the wake of the September 11, 2001 terrorist attacks, attached as Exhibit 2 hereto (the advisory itself is FBI classified).

that has occurred subsequently, and as a result, underestimated this demand. This is seen in the division of channels between voice and data that is weighted so heavily in favor of voice—i.e., a nine-to-one ratio in favor of voice between the Group A and Group B channels.

Since the time that LMCC submitted the Consensus Plan, the rapidly increasing demand for data communications has outgrown the limited number of non-voice channels allocated under Group B. A review of the Commission's licensing database demonstrates that a large number of users have been licensed for non-voice communications on the Group A channels. Indeed, it appears that non-voice communications have been authorized on *every single Group A channel*, with the result that currently, *none of the Group A channels are voice exclusive*. While the Group A non-voice licenses are being coordinated and granted on a *secondary* basis—along with corresponding grant of *primary* authorizations for voice communications on the same channels—it is Dataradio's understanding, based on long experience with data communications and familiarity with the marketplace, that these secondary non-voice authorizations are in reality being used on a primary basis. Many license holders in seeking coordinated spectrum have filed applications for voice as primary and data as secondary while in fact using their spectrum for data only. Thus, non-voice users are being coordinated on the Group A channels on a primary voice/secondary non-voice basis, as a direct response to the insufficient availability of Group B primary non-voice channels. The Consensus Plan and the NPRM do not reflect this market reality. Market realities mandate that additional channels must be made available to data operations.

**B. The FCC Should Not Limit Non-Voice Operations To Group B Channels**

The FCC has requested comments on; "whether Group A should continue to be designated primarily for voice operations with non-voice operations authorized on a

secondary basis or if non voice operations should be limited to Group B." As discussed in the preceding section, the market has undergone significant changes in both private and public networks, with the fast rising demand for data being the key driving factor. As the demand for non-voice operations already has outgrown the limited number of Group B channels, and there currently are so many non-voice operations licensed and carried out on the non-Group B channels, changing the rules now to limit such operations only to the Group B channels would wreak unprecedented upheaval. This is particularly true given the mission critical data applications being addressed in re-farmed low power channels that have significant safety and security ramifications.

The market demand for data communications as a primary use is a de facto reality. Dataradio submits that the Commission's regulations should reflect this reality by facilitating the granting of authorizations in accordance with the needs of the regulated marketplace. Thus, Dataradio cannot support limiting non-voice operations solely to the Group B channels.

**C. The FCC Should Make Power And Antenna Height Limitations Equivalent On All Coordinated Spectrum In This Band To Facilitate Future Coordination and Digital Migration**

Dataradio agrees with the FCC approach in using TPO as a measurement for mobiles, portables and fixed telemetry and ERP as measurement for fixed base station equipment for voice and data. However, Dataradio respectfully proposes that technical standards for TPO be equal, for voice and data in Groups A&B. In addition we would propose technical standards for infrastructure ERP be equal for voice and data in Groups A&B.

There is clear justification for this approach. It will result in equivalent contours and higher spectral efficiency throughout the band. It will reduce the probability of interference.

It will enhance the coordination of spectrum and provide a clean pathway toward digital migration for both and voice and data.

Dataradio thus suggests that within Groups A&B, TPO be limited to 5 watts for mobiles for both voice and data with a 5 watt TPO for fixed telemetry equipment. Base station equipment for either voice or data applications should have similar technical equality for ERP and maximum allowable antenna height. In Groups A and B channels, ERP limits should be 20 watts with maximum antenna height of 23 meters. Dataradio reiterates again that all manufactures of spectrally efficient equipment have or are in process of migrating to digital platforms. With digital systems, voice is data and data remains ones and zeros. From the perspective of coordination and spectral efficiency technical equality between data and voice is mandatory.

**D. The FCC Should Allow Primary Non-Voice Operations In Group A**

As discussed above, data operations on Group A channels today is pervasive nationwide. Therefore, Dataradio respectfully suggests that the FCC should promulgate a means to allow data as primary on Group A channels. In this context, we refer to §90.187(b)(2)(ii) as starting point to address coverage limitations. Specifically, the contour area should be defined at 39 dBu, using an overlap circle with radius not to exceed 10 miles from the base station location. We note that as data solutions generally are fixed, non-mobile applications using directional antennas pointed back to the master location, a significantly smaller radius than the 70-mile radius mandated for low power trunked voice operations is required. Dataradio further suggests that efficiency standards for equipment should remain as defined under Part 90 & Part 15 of the FCC rules today.

In considering minimum and maximum loading criteria for new license applicants requesting Group A channels with data as primary, we refer to §90.313 in seeking precedent as to how this issue should be addressed. 90.313 sets maximum loading per channel for public safety at 50 units. In seeking guidance from this section we note that 50 units per channel is based on paired channels for voice operations. In data applications for the quasi-public safety markets referenced in these comments, a single channel with polling architecture is most prevalent. Report by exception is mandatory in most of these applications. As a result, Dataradio does not believe that the issue of maximum loading for data need be addressed.

Fixed data systems operating in quasi-public safety and public safety applications for monitoring, control and report by exception are primarily deployed in polling architecture. Data communication is inherently more efficient than voice. It is quite possible to exceed a thousand points on a single channel and still have a safe efficient system. Maximum loading is best determined by the application, the number of bits per unit per poll and response, and the number of polls per unit required per 24-hour period. These variables are application dependent and hence establishing maximum criteria is not necessary and could only serve to limit marketplace developments.

However, if loading criteria should be a consideration in allowing data as primary on Group A channels, and minimum criteria are required, we then would then reference 90.313(1). In this context, Dataradio believes that 25 units would be an appropriate requirement within two years of initiation of operation per channel.

#### **E. Technical Requirements For The Group B Channels**

The FCC has requested comments on a number of issues related to the tentative conclusions for the Group B channels. Dataradio agrees with the Commission's intent to use TPO for mobile/portable and fixed solutions. However, as noted above, Dataradio is in disagreement with the suggestion of providing only a maximum TPO of 2 watts for data in coordinated Group B non voice operations while proposing a 5 watt TPO for mobile/portable operations in coordinated voice Group A channels. Dataradio also disagrees that fixed base stations for data should be measured in TPO, having no allowance for increased ERP as is contemplated in voice operations. We note the TPO measurement could result in maximum gain on directional or Omni-directional antennas being used, which could in fact exceed the base station standards for Group A voice at 20 Watts ERP.

Dataradio respectfully submits that this lack of consistent technical standards between voice and data would impede the FCC mandate for maximum spectral efficiency. The distinction is unnecessarily discriminatory and will only complicate coordination and digital migration. Digital implementation is upon all manufactures of voice and data equipment. The FCC must consider re-farming and digital migration. Again, data is inherently more efficient than voice, and hence all public network cellular providers have migrated to digital operations—under such operations, voice is reduced to data, and data is voice. Dataradio believes technical equality between TPO and ERP among Group A and Group B channels on a coordinated basis would bring significant benefit to spectral efficiency, enhance coordination, and limit interference probability by removing major variables. This would also resolve a key concern missing in the NPRM, the foundation for digital migration.



Thus, Dataradio suggests that Group B channels remain coordinated and that TPO for mobile, portable and fixed telemetry equipment be raised to 5 watts. For fixed equipment that is non-infrastructure equipment, maximum antenna height should remain at 7 meters. However, there should be an allowance for base station infrastructure on the same par with Coordinated Group A channels, allowing for a maximum ERP of 20 watts and a maximum antenna height of 23 meters.

Based on Dataradio's long experience and leadership in data solutions for Supervisory Control and Data Acquisition (SCADA), Dataradio believes that the requirement for continuous carrier in the quasi-public safety markets is a rare occurrence. As previously stated, polling and report by exception predominates. Factory automation and control, where constant carrier is prevalent, is undergoing an ever-increasing migration to unlicensed spectrum where channel bandwidth is sufficient to allow wireless LAN extensions and IP connectivity to extend to floor equipment. If Group B channels are made data primary, and Group A channels allow for primary status for data as well, it may be possible to contain continuous carrier NB applications to the Group B channels. It is Dataradio's view that having technical equality across Group A and Group B channels, would go a long way toward mitigating concerns of continuous carrier users (a minority) without significant impact to overall spectrum availability and re-use.

**F. Operations On The Group B Channels Should Remain Data Only**

Dataradio as a petitioner previously raised with the Commission strong concerns for real and potential catastrophic hazards associated with co-channel use of voice and data applications. Dataradio remains convinced that these are justifiable concerns. These concerns are highlighted by the recent call from the FBI for heightened security and

monitoring of essential quasi-public safety entities: Utilities, including nuclear power plants, freshwater reservoirs and wells, energy distributors and similar entities rely heavily on the spectrum addressed in this NPRM. As noted above, a 9-to-1 discrepancy already exists in the NPRM between voice and data channels. It is within that context that Dataradio has voiced its concerns. In light of the dependence of these entities on mission critical data communications and the inarguable fact of the growing demand for such data solutions, it clearly serves the public interest to have a "safe harbor" for data operations. Dataradio believes market forces, if allowed to work, will prove the point. Protecting the safe harbor for critical data applications on a nationwide basis will allow such mission critical users first priority in seeking and obtaining licenses within this spectrum. Additionally, allowing data on a primary basis within Group A would allow voice and data to effectively co-exist and compete in the other 50 channels. This will allow the FCC to effectively monitor real market forces in adjusting low power regulations in the future.

Respectfully Submitted,

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Its Counsel

Dated: October 12, 2001

## **EXHIBIT 1**

## Market Data

“About one billion people will use wireless data services by 2005.”

**ARC Group**

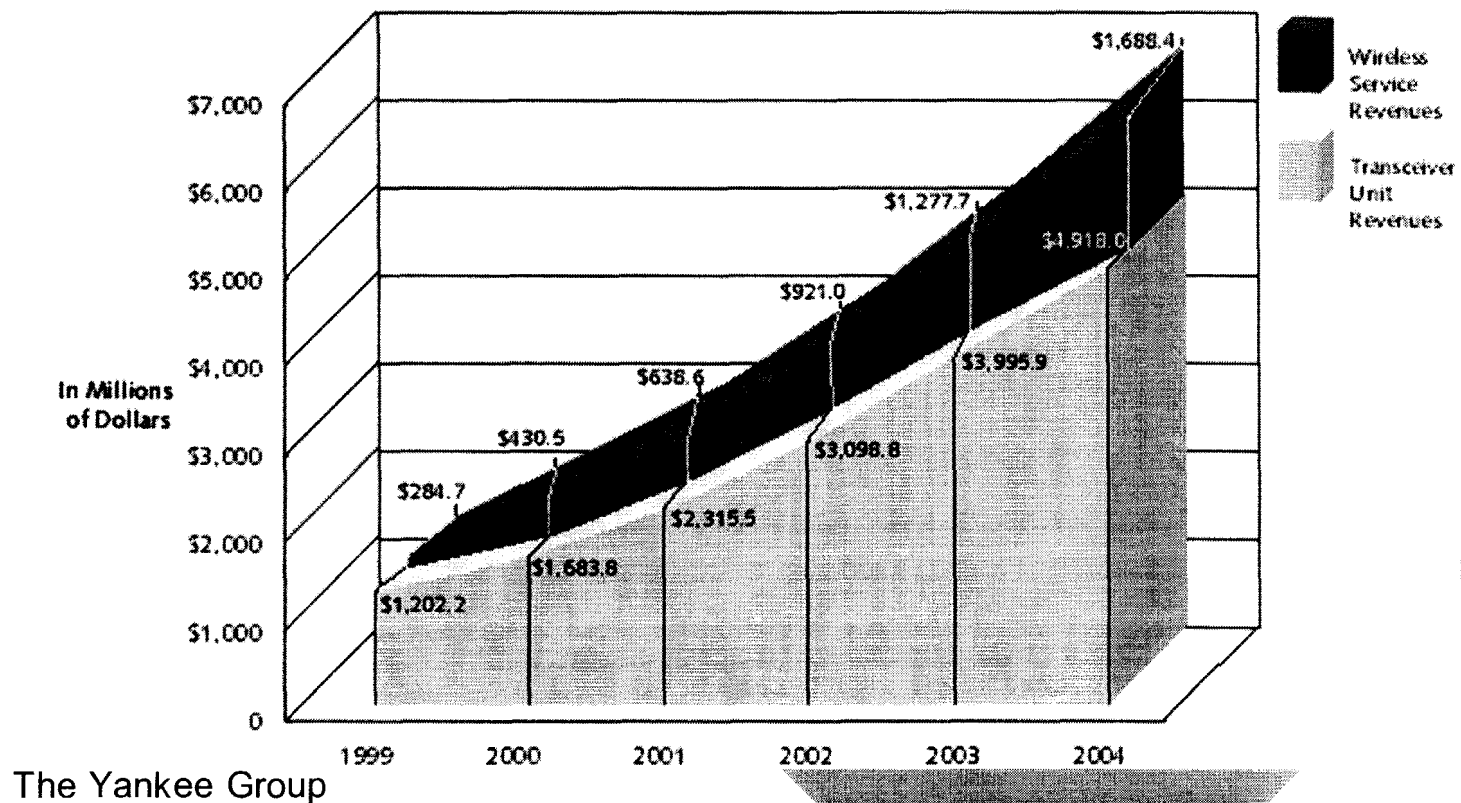
“The convergence of wireless, computerization and the internet have created a slew of affordable and practical tools and components that make it easier to provide end-to-end solutions.”

**The Yankee Group**

“Combined with the proliferation of computing and internet solutions, there is a new market for telemetry solutions to be integrators with any machines that contain processing power and memory.”

**The Yankee Group**

# Wireless Telemetry Revenue Forecast



## **EXHIBIT 2**

## Security Tightened At Water Suppliers

*By Chris L. Jenkins and Jason McGahan*  
Washington Post Staff Writers  
Sunday, October 7, 2001; Page PW01

Local departments and agencies that provide water for Prince William County, Manassas and Manassas Park have increased security at their water sources and treatment plants in the wake of the Sept. 11 attacks on the Pentagon and the World Trade Center.

The FBI issued an advisory to agencies and departments after the terrorist attacks, indicating that additional security measures should be employed, although a specific threat had not been identified.

Lake Manassas, which is owned by the city, is one of several sources that provides water to Manassas and parts of Prince William and Manassas Park. Manassas City Manager Lawrence D. Hughes said security was increased at the lake and the water treatment plant off Glenkirk Road the day of the attacks, but he declined to reveal specifics.

The Occoquan Reservoir delivers water to eastern Prince William through the Fairfax County Water Authority, where officials said that their facilities have been locked down, surveillance cameras added and security increased.

Manassas Park also draws on three wells within city limits that provide 500,000 gallons of water a day to residents. City Manager David W. Reynal said that security measures have been beefed up at the pump stations as well.

Many officials for regional water suppliers said the likelihood that terrorists would create massive health problems by introducing a pathogen or toxins throughout a local water supply is remote. The large volume of water they would have to poison is one aspect that makes such a scenario improbable.

"If someone were to throw a balloon full of agent X into one of the open spaces at a treatment plant, the dilution would be the first thing working against them," said Thomas P. Jacobus, general manager of the U.S. Army Corps of Engineers' Washington Aqueduct.

In Manassas, the water facility treats and distributes more than 11.5 million gallons a day, with about 5 million gallons going to the city and the county and 750,000 to Manassas Park, said Jim Johnson, water and sewer superintendent for Manassas.

Several water analysts said poisoning a body of water such as Lake Manassas or the Potomac River would require a truckload of a harmful agent, an amount easily detectable by plant sensors.

The Fairfax County Water Authority held a closed-door meeting Sept. 20 to discuss heightened security. As part of a precautionary plan, officials ordered chemists to test water samples more often.

"We're sampling the water . . . as we're treating it and sampling it as it's coming out of the plant," said authority spokeswoman Sandy Farrell. "I'm not prepared to give specifics, but we have an ever-increasing line of barriers."

Thomas P. Bonacquisti, director of water quality for the authority, said: "We have a broad-based toxicity test we normally do every day. At a time like this, we've just stepped it up."

Local treatment plants purify water using similar methods. First, sediment is separated from the untreated water by a substance that causes it to sink. Then disinfectants such as chlorine and ozone are added to kill lingering bacteria such as salmonella and rickettsia, which can cause typhus.

"The chlorine we use is a wonderful oxidant, and that means it basically attacks other chemicals we find and disables them," Jacobus said.

Sensors are present throughout the process to monitor bacteria and regulate chlorine dosages.

"You've got to understand, a water treatment plant has been built to take out pathogens," Bonacquisti said. Procedures have long been in place at local water facilities should a pathogen survive the filtering process, including shutting down one reservoir and taking water from another.

Plants have also taken precautions to guard against someone tampering with water after it has been treated, as it travels from a plant to a neighborhood. In Arlington County, ammonia is added to chlorine to produce a slightly less powerful but longer-lasting disinfectant called chloramine that stays with the water all the way to the faucet, said county spokesman Richard Bridges.

In addition, local companies that distribute water even after it has been treated have stepped up their testing procedures. The Alexandria-based Virginia-American Water Co. provides water to 18,000 homes and businesses in Dale City. It has increased the frequency of its testing along several checkpoints, a company spokesman said.